

Grape waste could make competitive biofuel

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The solid waste left over from wine-making could make a competitive biofuel, University of Adelaide researchers have found.

Published in the journal *Bioresource Technology*, the researchers showed that up to 400 litres of bioethanol could be produced by fermentation of a tonne of [grape](#) marc (the leftover skins, stalks and seeds from wine-making).

Global wine production leaves an estimated 13 million tonnes of grape marc waste each year. Nationally it is estimated that several hundred thousand tonnes are generated annually and it is generally disposed of at a cost to the winery.

"This is a potentially economic use for what is largely a waste product," says Associate Professor Rachel Burton, Program Leader with the Australian Research Council (ARC) Centre of Excellence in Plant Cell Walls in the School of Agriculture, Food and Wine.

PhD candidate Kendall Corbin analysed the composition of grape marc from two [grape varieties](#), cabernet sauvignon and sauvignon blanc. She also investigated pre-treatment of the grape marc with acid and enzymes.

Ms Corbin found that the majority of the carbohydrates found in grape marc could be converted directly to ethanol through fermentation with a yield of up to 270 litres per tonne of grape marc. The leftover product was suitable for use as an animal feed or fertiliser.

Ethanol yields could be increased by pre-treatment with acid and enzymes up to 400 litres a tonne.

"Using plant biomass for the production of liquid biofuels can be difficult because of its structurally complex nature that is not always easily broken down," says Ms Corbin.

"Grape marc is readily available, can be sourced cheaply and is rich in the type of carbohydrates that are easily fermented."

Associate Professor Burton says: "We've shown that there is a potential new industry with the evolution of local biofuel processing plants to add value to the grape for an environmentally friendly biofuel."

Provided by University of Adelaide

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